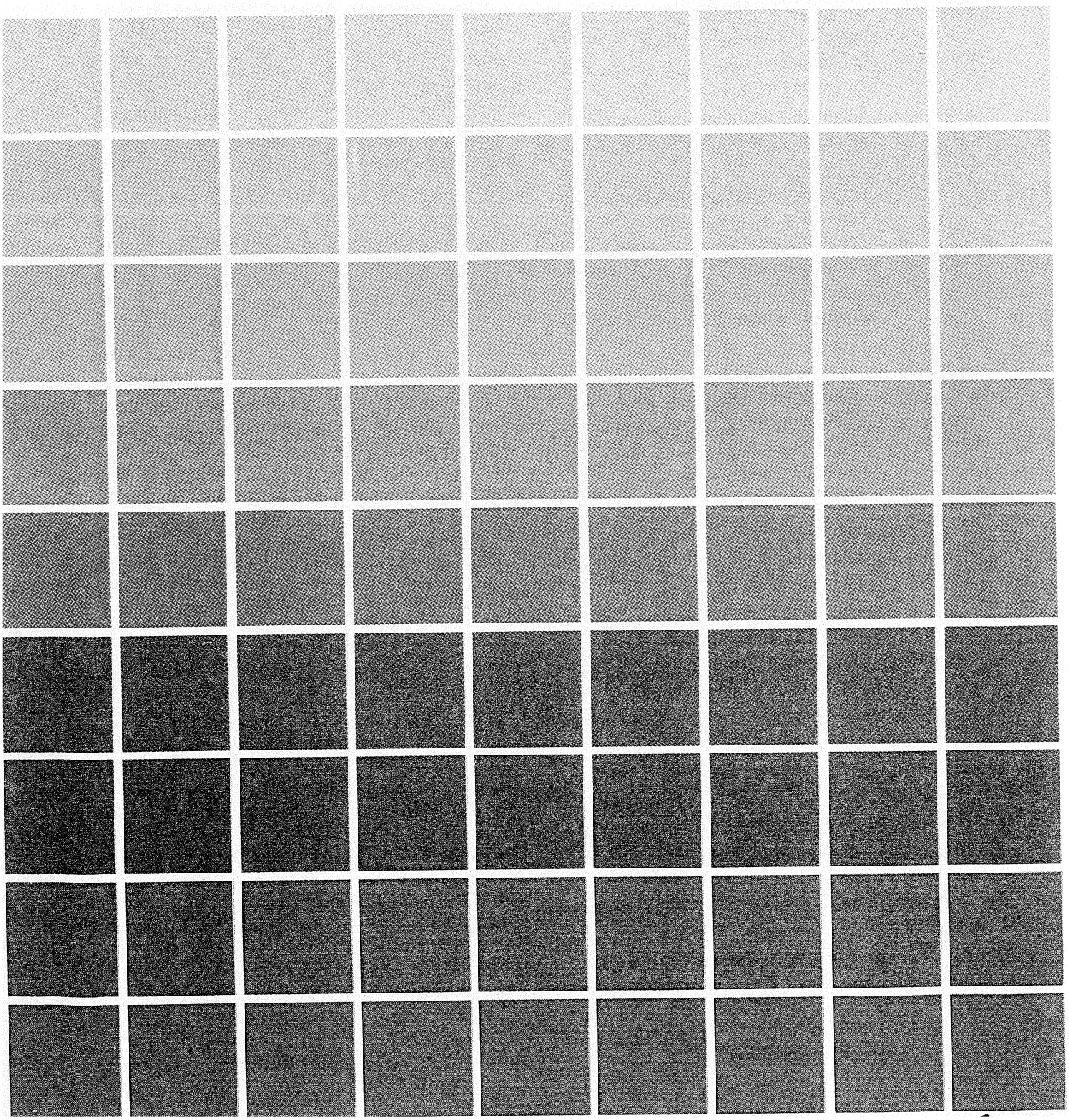
Bedienungsanleitung
Operating Instructions
Mode d'emploi
Istruzioni per l'uso

GRUNDIG
R 2000

DIN 45500
HIGH FIDELITY



Zur Beachtung

Ihr wertvolles Gerät darf sicher die gleiche sorgfältige Behandlung beanspruchen, die Sie auch Ihren Möbeln angedeihen lassen: Große Hitze oder Feuchtigkeit vermeiden. Gehäuse nur mit weichem, staubbindendem Lappen reinigen. Keine scharfen Polier- oder Reinigungsmittel verwenden.

Die Deutsche Bundespost macht darauf aufmerksam, daß die „Allgemeine Ton- und Fernseh-Rundfunkgenehmigung" nur zum Errichten und Betreiben von Ton- bzw. Fernseh-Rundfunkempfängern berechtigt. Es dürfen damit nur Sendungen des Rundfunks empfangen werden. Andere Sendungen dagegen nicht.

Important

The case of the unit should be treated as a piece of furniture. The unit should not be subjected to high temperatures or high humidity and should only be cleaned with a soft cloth (preferably anti-static). Never use abrasive polishes or cleaning agents as the surface will almost certainly be damaged.

The German Federal Postal Authorities draw your attention to the fact that the "General Sound and TV-Radio Licence" entitles you only to install and to operate sound, TV and radio receivers. Only radio transmissions and no other kind of transmissions may be received by means of these sets.

Avis important!

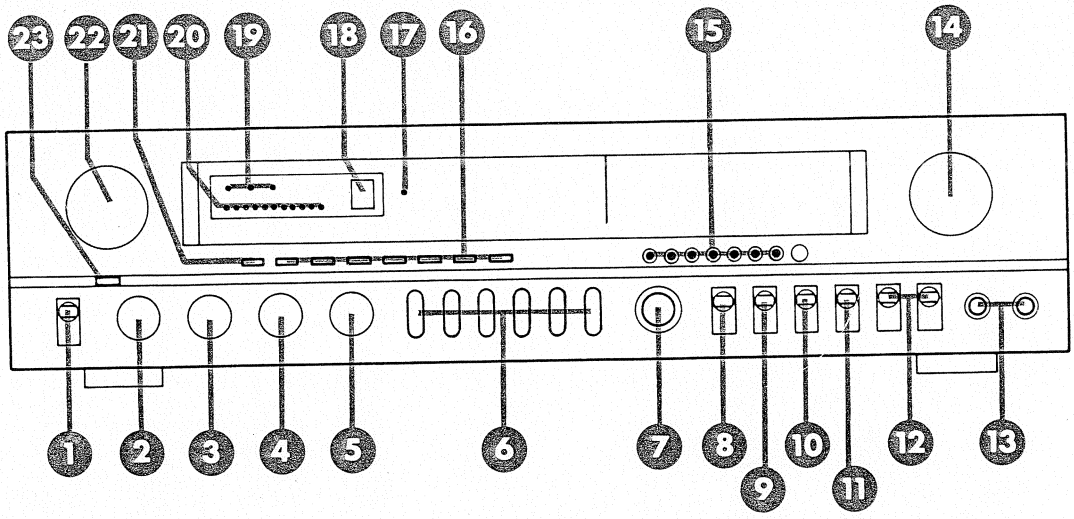
Votre précieux appareil a certainement droit aux mêmes soins que le reste de votre mobilier: chaleur excessive et humidité sont à éviter. Les fentes d'aération ne doivent en aucun cas être obstruées. Nettoyer l'ébénisterie à l'aide d'un chiffon doux antipoussière, à l'exclusion de tout autre produit de polissage.

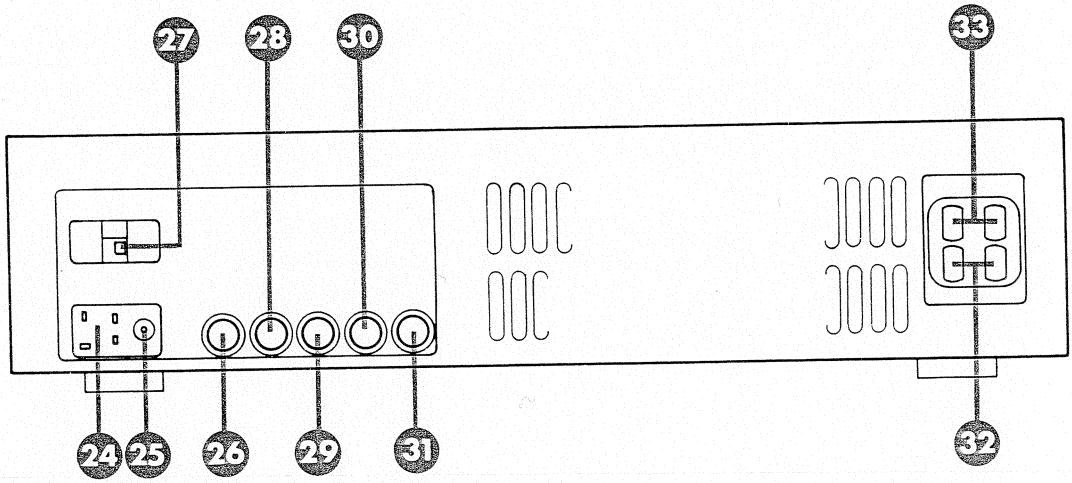
Nota!

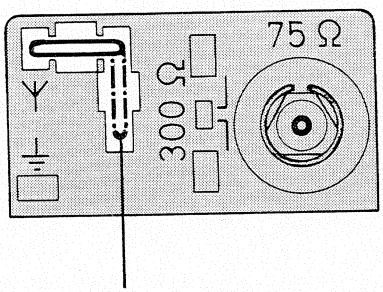
Le service des postes et télécommunications allemand fait remarquer que l' «autorisation générale concernant la radiodiffusion et la télévision» donne seulement le droit d'utiliser des récepteurs de radiodiffusion et de télévision aux seules fins de recevoir des émissions de radio.

Nota

Per la sua buona conservazione, trattare l'apparecchio con le stesse cure che si hanno per gli altri mobili della casa. Tenerlo lontano da fonti di eccessivo calore e di umidità e pulirlo solamente con un panno morbido evitando prodotti corrosivi.







Drahtbrücke waagrecht = Antennen für AM und FM (300 Ω und 75 Ω) durchverbunden
Drahtbrücke senkrecht = Antennen getrennt

Shorting link horizontally = aerials for AM and FM (300 Ω and 75 Ω) interconnected.
Shorting link vertically = aerials separated.

Boucle en position horizontale = antennes AM et FM (300 Ω et 75 Ω) internément liées.
Boucle en position verticale = antennes AM et FM séparées.

Ponticello in posizione orizzontale = antenne AM e FM (300 Ω e 75 Ω) collegate internamente.
Ponticello in posizione verticale = antenne AM e FM separate.

(GB)

❶ Power switch for switching on and off (bottom = on)
❷ Bass control
❸ Presence control (medium tones)
❹ Treble control
❺ Stereo balance
❻ Programme buttons (for FM station selection with tuning knob ⓮ press also the small button ㉑)
❼ Tape socket TB/TAPE 2
❽ Monitor switch (set to bottom only for tape monitoring)
❾ Switch for muted tuning on VHF/FM, bottom = on
❿ MPX switch (set to bottom position for stereo reception)
⓫ AFC switch, bottom = on
⓬ Loudspeaker group switches
⓭ Connections for stereo headphones (6.3-mm jack plugs)
⓮ Knob for manual tuning
⓯ Controls for FM station presetting (adjusting key is located to the right of the controls)
⓰ VHF/FM station buttons 1 . . . 7
⓱ LED indication for stereo reception
⓲ Numerical display of selected station button
⓳ "Tunoscope" indicator for exact centre tuning on FM
⓴ LED tuning indicator (on FM, field strength indication)
㉑ Small U button, must be depressed for FM station selection with tuning knop ⓮
㉒ Volume control
㉓ Linear switch
㉔ Connections for AM aerial (LW, MW) Y, earth ⏚ and FM dipole (300 Ω)
㉕ Coaxial socket for 75 ohm aerial
㉖ Connection for record player with magnetic pick-up
㉗ Gain switch for phono input ㉖
㉘ Connection for tape/cassette recorder or record player with ceramic/crystal pick-up (TB/TAPE 1)
㉙ Connection for an additional tape/cassette recorder (TB/TAPE 2)
㉚ Line output (high-level voltage output)
㉛ Monitor socket
㉜ Connections for loudspeaker group LS 1 (R = right channel, L = left channel)
㉝ Connections for loudspeaker group LS 2

Installation

If HiFi components in a rack or cabinet (Compact-System) are to function properly, i. e. without excessive accumulation of heat and reciprocal effects, the following must be strictly observed.
Depending on the number and combination of the employed HiFi components, they are to be placed one above the other into the rack (Compact-System) as shown in the pattern below:

Record player (PS)
Receiver (R)
Cassette deck (CF)

This is the maximum number of components that can be installed. If one or the other set is deleted, leave the remaining sets in the sequence indicated. Same is valid for free installation.
Mains cables must **not** be placed near AF leads, like connection leads of record player, cassette deck, tuner or loudspeakers.
In the GRUNDIG HiFi range you will find the appropriate racks and Compact-Systems for your GRUNDIG HiFi units. Your dealer will be glad to advise you.

Mains Connection

The set is designed to operate from an AC mains supply of 220 V (50/60 Hz).

Additional information for sets sold in Great Britain

The set is designed to operate from a mains supply of 240 V AC. We recommend that a 13 amp 3-pin plug fitted with a 2 amp fuse be used. The brown lead should be connected to the live pin (marked 'L' or 'red' or 'brown') and the blue lead must be connected to the neutral pin (marked 'N' or 'black' or 'blue'). On no account should either of the wires be connected to the earth pin (marked 'E' or 'green/yellow'). If other mains plugs are used, ensure that they are protected with a 2 amp fuse.
We recommend that the set be disconnected from the mains when not in use for long periods.

Aerials

In primary service areas good results can be obtained on FM with a simple room dipole eg: GRUNDIG FM strip dipole.
For the best possible results we recommend the use of an outside FM dipole especially when receiving stereo broadcasts. Remember 10 times as much aerial signal is required when receiving a stereo transmission. Even an outside FM dipole may not be suitable in mountainous regions or for long distance reception unless it is mounted as high as possible above the roof of the house.
On the back of the unit there are flat sockets for aerials and earth (pos. ㉔). The sockets ⌐|⌐ are for connecting an FM dipole (300 Ω). When an outside FM dipole is used, AM (LW, MW) reception may also be improved, if the shorting link is inserted horizontally between the two upper flat plug sockets (see detailed drawing, page 3).
If separate outside aerials for FM and MW/LW are being used, the shorting link must be inserted vertically between the flat plug sockets (blind connection), otherwise inter-action between the two aerials will occur.
The high-impedance socket Y is intended for the connection of an external AM aerial.
A 75-ohm aerial system can be connected to the coaxial socket ㉕. In addition to FM it serves also for AM, when the shorting link is inserted horizontally between the AM aerial socket Y and FM socket (as above).
If you are not sure of signal conditions in your area, and remember that a good signal is essential for optimum stereo reception, we suggest you contact your dealer who will be pleased to advise you as he will be familiar with the conditions for reception in your area.

Loudspeakers

To achieve the best results we recommend that you choose GRUNDIG HiFi Loudspeaker Enclosures as these are of the highest quality and capable of handling the full output power of the unit.
On the rear of the set, connecting sockets for two separate stereo loudspeaker groups are provided (pos. ㉜, ㉝). These speaker groups (LS 1 and LS 2) can be operated simultaneously in two separate rooms. The loudspeaker impedance must be 4 Ω to obtain full power output. It is permissible, however, to use loudspeakers with an impedance of up to 16 Ω provided that the loss of output power experienced is tolerable.

Loudspeaker groups I or II, used for stereo reproduction, will deliver 2 x 50 nominal power (2 x 75 W music power). For two room stereo (groups 1 + 2), the power output will be 4 x 15 W nominal (4 x 60 W music power).
Always make sure that the right-hand loudspeaker unit is connected to the RH socket and vice versa.

Overload Protection

The circuit has been designed so that it will sense open and short circuit loading conditions. It will also sense over capacitive or over inductive loads and the automatic overload protection circuit will then operate. Thermal protection devices have also been fitted to the mains input transformer and onto the heatsinks of the output transistors. These transistors are therefore protected against destruction by overload and high operating temperatures. Should a fault condition occur these overload protection circuits will reset themselves when the fault has been cleared.
An electronic loudspeaker protection circuit prevents the destruction of the loudspeakers should a fault occur in the power amplifier.

Switching On and Off

The set is switched on and off by means of the toggle switch "POWER" (pos. ❶): Bottom = on; top = off.

Loudspeaker Selection Switches

The toggle switches ⑫ allow to switch on and off separately the two loudspeaker groups. Bottom position = on, top position = off.
Note: set Monitor switch ❽ only for monitor operation to its bottom position — always to top position if not used!

Programme Buttons ❻

The desired programme is selected by depressing the appropriate programme button, to release simply depress the other.

TA/PHONE	=	Playback of records via socket ㉖
TB/TAPE 1	=	Tape replay via socket ㉘
TB/TAPE 2	=	Tape replay via socket ㉙ or ⑦
U/FM	=	(VHF) FM Band
MW	=	Mediumwave Band
LW	=	Longwave Band

For FM tuning with tuning knob ⑭ also depress the small "U" button ㉑.

Station Tuning

Tune in the desired station with the tuning knob ⑭ situated on the right of the set. Tune for maximum indication on the LED array ⑳. This LED array is also used for field strength indication on FM (see corresponding paragraph).

Volume Control

Adjust the volume with knob ㉒.
The set is provided with a facility that compensates for the change in frequency response of the human ear as the sound intensity is reduced. As the volume control is reduced through medium to low volume the bass and high frequencies are progressively boosted to give a balanced overall sound impression. This physiological compensation can be switched off by pressing the small button ㉓. The set is now in the "linear" reproduction mode (no accentuation of any particular frequency range), which is of advantage when speech is being reproduced. It is generally recommended not to press the button (release by pressing again).

Stereo Radio Reception

The set is equipped for the reception of FM stereo transmissions according to the pilot tone system. The integrated stereo decoder is fitted with an automatic switch which can distinguish whether a stereo or mono programme is being received. The set should generally be left in stereo mode (set toggle switch "MPX" ⑩ to bottom position). The decoder will then automatically select the correct method of reception. The stereo indicator ⑰ in the scale lights up when a stereo programme is being received. To reduce the noise when receiving weak stereo transmission, it is recommended to switch to mono by setting the toggle switch ⑩ to top position.

Automatic Frequency Control on FM (AFC)

The automatic frequency control is in operation when the toggle switch "AFC" ⑪ is set to bottom position. It locks in a station once it is tuned in. When tuning in a different FM station switch off the AFC by setting the toggle switch "AFC" to top position. Do not use the automatic frequency control to receive a weak station close to a much stronger one otherwise the receiver will lock onto the stronger station of the two with the automatic frequency control in operation.

FM Station Buttons ⑯

The buttons permit pre-selection of FM stations. These are tuned in by the small knobs ⑮ located to the right of the programme buttons. For easier tuning use the provided key.
For station programming proceed as follows:

- Switch off AFC.
- Press the desired station button. Its number is shown in display ⑱.
- Fit the key into corresponding tuing knob and tune in desired station.
  The small dials above the tuning knobs will assist you in tuning.
  Pointer to the left = lower frequencies (up to 87.5 MHz);
  to the right = higher frequencies (up to 108 MHz).
- Tune for maximum indication on the LED array ⑳. The "Tunoscope" ⑲ is an additional great tuning aid on FM — see corresponding paragraph.

When all the required stations have been stored the AFC should be switched on again. It will assure correct tuning when a station is recalled.

FM "Tunoscope"

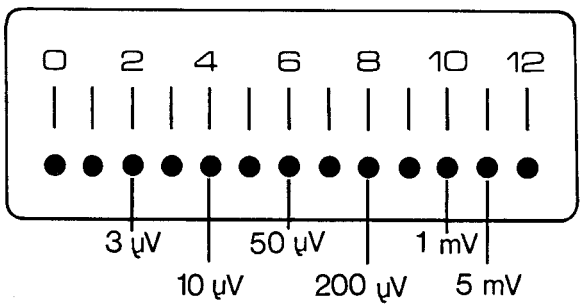
The three light emitting diodes ⑲ permit easy and accurate tuning of FM stations. For this first switch off the AFC. Now tune in the desired FM station so that only the middle green LED lights up. The one or the other red LED will light up if the station is not accurately tuned in. If both red LEDs are lighting, only a very weak station or no signal at all is received. In this case, tune in the station using the LED tuning indication ⑳. The Tunoscope facility may also be of great help for programming the individual FM stations. Switch on the AFC again after having tuned in the station.

FM/VHF Muting

With the toggle switch "MUTING" ⑨ set to bottom position, interstation noise will be muted when tuning on the VHF/FM band. It may be found that it is only possible to listen to very weak VHF stations when the muting circuit is switched off (lever "MUTING" set to top position).

VHF/FM Field Strength Indication ⑳

The LED array can be very useful on VHF/FM for indicating the field strength. Where it is possible to receive several identical stations of varying strength, the set should be tuned to the transmitter which gives the highest field strength reading, especially where stereo transmissions are to be received. It cannot be emphasised too much that stereo radio requires a much higher aerial input signal than for the same programme in mono.
For the technically minded: — the minimum signal, recommended for this unit for satisfactory stereo reception, is 25 µV. Below this figure one can expect a deterioration in signal to noise ratio.



The aerial voltages quoted are approximate values in 300 Ω.

Tone

The bass, medium and treble tones can be adjusted separately and independently using the controls ❷, ❸ and ❹.

Stereo Balance Control

The relative output between left and right loudspeakers can be adjusted with the balance control ❺. The control can be used to compensate for poorly positioned loudspeakers or unfavourable room conditions.

Headphones

Connecting sockets for two stereo headphones are located in the front panel of the unit (pos. ⑬). Headphones with a 6.3-mm jack plug and an impedance of 8 to 2000 ohms are suitable, in particular GRUNDIG stereo headphones which are matched perfectly.

Record Player Connection (DIN)

For connecting a record player with magnetic pick-up, socket ㉖ on the rear of the set is provided. The set incorporates a separate pre-amplifier/equalizer so that a separate equalizer is not necessary.
For connecting a record player with magnetic system and combined pre-amplifier/equalizer or ceramic/crystal cartridge, the sockets ㉘ and ㉙ are provided. For record reproduction, depress the corresponding button.
With the switch ㉗ on the back of the set, it is possible to change the input sensitivity of socket TA/Phono ㉖. When this switch is set to position "High", the sensitivity is of a value that corresponds to the current DIN regulations and the standards of the record manufacturing industry. When setting switch ㉗ to position "Low", the gain factor is attenuated by approx. 6 dB (approx. the half). By this, an improved stability against overmodulations, which are frequently encountered when playing highly modulated records (as for example direct-cut records) or when using pick-ups delivering high output voltages, is obtained. Same switch can also be used to compensate for volume differences between the individual sound sources (radio, record player, tape recorder).

Tape Recorder Connection (DIN)

The Sockets ㉘ and ㉙ on the rear of the set can be used to connect tape/cassette recorders for both record and replay or to rerecord from one machine onto the other. The two sockets are equivalent and are switched into circuit with the button TB 1 or TB 2. For playback or rerecording select the TB socket to which the reproducing tape/cassette recorder is connected. An additional socket TB 2 ❼ is located in the front of set. This socket is selected with the button TB 2. When nothing is connected to the rear socket TB 2 (pos. ㉙), the front socket ❼ offers the same possibilities as the rear socket. If the rear tape socket is occupied, then the front socket ❼ should be used for recording only. Rerecording between the front socket ❼ and the rear socket TB/TAPE 1 (pos. ㉘) is always possible. Please see also the operating instruction of the tape/cassette recorder.

Via Tape Monitoring

This set is provided with a monitor socket (pos. ㉛) which permits via tape monitoring when recording onto a tape machine being designed for monitoring operation. Connect the Monitor socket with a standard lead (e. g. GRUNDIG lead 242) to the corresponding socket on the tape machine. If you now set the Monitor switch ⑧ to its bottom position, the recording is continued without interruption, but the receiver amplifier is connected to the playback contacts of the Monitor socket and you will hear the just recorded signal. By setting the Monitor switch repeatedly to its top and then to its bottom position, you can compare the just recorded programme with the original programme, and thus check the recording.

Line Output Socket

Socket LINE ㉚ is a low impedance/high level voltage output for making high quality recordings on a tape recorder with a corresponding line input socket. It is also possible to connect a mixer or reverberation unit to the Line output and play back via the Monitor socket with the receiver being switched to Monitor operation (MONITOR switch ⑧ set to bottom position). The Line output socket can also be used to feed another amplifier or sound to light display.

Technical Specification (Receiver section)

Waveband Coverage:

VHF/FM: 87.5 . . . 108 MHz
MW: 510 . . . 1620 kHz
LW: 145 . . . 350 kHz

Sensitivities:

FM mono: 0,65 µV with S/N ratio of 26 dB (75 Ω, 40 kHz deviation)
FM stereo: 25 µV with S/N ratio of 46 dB (75 Ω, 40 kHz deviation)

Stereo Switch-over Threshold:

10/9 µV at 97.5 MHz and in 75 Ω

Muting Switch-over Threshold

2.5/5 µV at 97.5 MHz and in 75 Ω

Sensitivities:

AM: MW Band 10–15 µV
LW Band 11–18 µV
} with dummy aerial

Intermediate Frequencies:

FM: 10.7 MHz; AM: 460 kHz

FM Limiting:

Limiting Point, (–1/–3 dB) 0.6/0.45 µV in 75 Ω

Bandwidth:

FM-IF, 130 kHz (approx.)
AM-IF, 4.5 kHz (approx.)
FM demodulator: 800 kHz

IF Stability:

FM: ≧ 80 dB
AM: ≧ 46 dB

AM Suppression:

≧ 56 dB at 1 kHz (measured with 22.5 kHz deviation and 30 % modulation at 1 mV in 75 Ω)

Image Rejection:

FM: ≧ 60 dB
MW: 40–50 dB
LW: 50–68 dB

AFC Accuracy (VHF/FM):

Switchable, capture range ± 300 kHz
Holding range ± 500 kHz

Capture Ratio:

≦ 1 dB for –1 dB/–30 dB AF level on speaker output at 1 mV in 75 Ω and 40 kHz deviation.

FM Signal to Noise Ratio (Unweighted)

To DIN 45 405 in the range 31.5 Hz . . . 15 kHz measured at 50 W (deviation 40 kHz; effective value) and 1 mV in 75 Ω
Mono/Stereo: ≧ 75/67 dB
Mono/Stereo: ≧ 69/65 dB at 50 mW output

FM Signal to Noise Ratio (Weighted)

to IHF, curve "A", measured at 1 mV in 75 Ω
50 W Mono/Stereo: ≧ 79/65 dB
50 mW Mono/Stereo: ≧ 70/64 dB

Frequency Response (VHF/FM):

from aerial input to loudspeaker output:
15 Hz – 16 kHz with –3 dB
30 Hz – 15 kHz with –1 dB

Stereo Pilot Leakage:

≧ 60 dB at 19 kHz
≧ 55 dB at 38 kHz

Distortion Factor:

Mono/Stereo: ≦ 0.4 % at 1 kHz 40 kHz deviation and 1 mV in 75 Ω (to DIN 45 500)

Dynamic Selectivity on Mono

(± 300 kHz, referred to 40 kHz deviation, –30 dB noise): > 60 dB

Stereo Decoder:

Integrated circuit PLL decoder with automatic indicator and RF level Mono/Stereo switching. (Level set for 10 µV in 75 Ω).

FM Crosstalk:
1 mV at aerial and 47.5 kHz deviation:
1 kHz – ≧ 40 dB
250 - 6300 Hz – ≧ 38 dB
6.3 - 10 kHz – ≧ 30 dB
Measured at selected points.

Safety Circuits:
To all European norms and IEC Regulations, etc.

De-emphasis:
50 µ/secs to standard

Technical Specification (Amplifier section)

Sine Output Power into 4 Ω / 8 Ω:
2 x 50 W / 2 x 33 W (DIN)

Music Power into 4 Ω / 8 Ω:
2 x 75 W / 2 x 40 W (DIN)

Nominal Power:
2 x 50 W

Distortion Factor (at nominal power):
≦ 0.02 % (1 kHz)
≦ 0.09 % (40 Hz – 20 kHz)

Intermodulation (at nominal power):
≦ 0.09 %

Damping Factor (4 Ω):
36 (R_i = 0.11 Ω)

Frequency Response:
at Phono for -1/-3 dB:
30 Hz – 40 kHz/25 Hz – 70 kHz;
at Tuner, TB (Monitor) for -1/-3 dB:
20 Hz – 40 kHz/10 Hz – 70 kHz

Power Bandwidth:
<5 Hz . . .> 80 kHz

Stereo Crosstalk L-R:
1 kHz ≧ 66 dB
40 Hz ≧ 65 dB
20 kHz ≧ 45 dB

Crosstalk
between monitor/recording
and programme/monitor:
1 kHz ≧ 80 dB
20 Hz ≧ 80 dB
20 kHz ≧ 70 dB

Input Sensitivity (at nominal pwr):
Phono: ≦ 1.6/3.2 mV
TB (Monitor): ≦ 175 mV

Maximum Input Voltages:
(Input overload point)
Phono: ≧ 70/140 mV
TB (Monitor): ≧ 8 V

Signal Noise Ratio (Unweighted):
(Effective/peak value to DIN 45 405):
a) at nominal power
Phono: ≧ 74/70 dB
TB (Monitor): ≧ 95/90 dB
b) at 2 x 50 mW into 4 Ω
Phono: ≧ 69/64 dB
TB (Monitor): ≧ 70/66 dB

Signal/Noise Ratio (Weighted)
to IHF, curve "A":
a) at nominal power
Phono: ≧ 80 dB
TB (Monitor): ≧ 100 dB
b) at 2 x 50 mW into 4 Ω
Phono: ≧ 73 dB
TB (Monitor): ≧ 75 dB

Line Output
450 mV in 47 kΩ for 5 mV on Phono input.
430 mV in 47 kΩ for 500 mV on TB (tape) input.

Treble Control: ±14 dB at 16 kHz

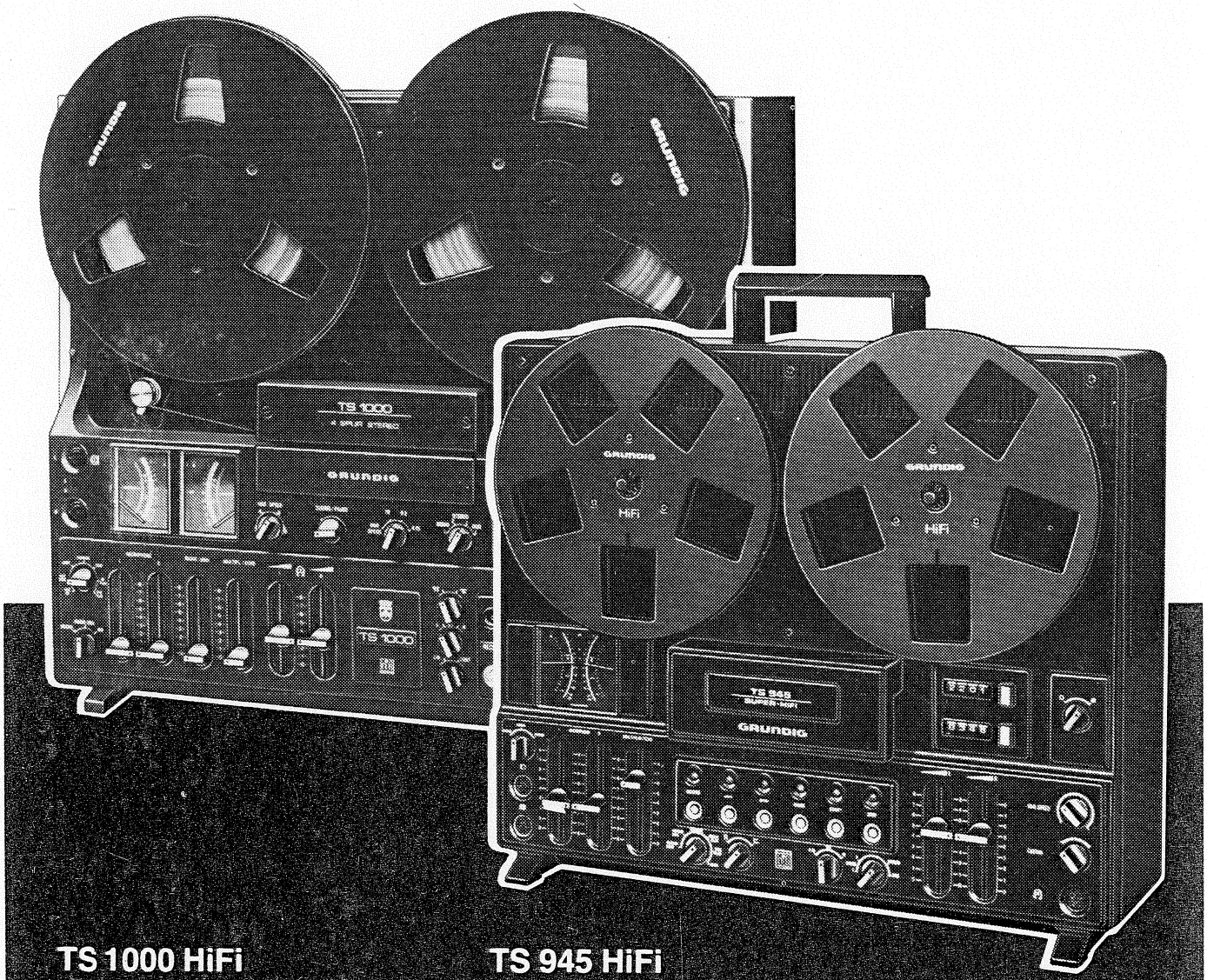
Bass Control: ±15 dB at 40 Hz

Presence Control: ±12 dB at 2.5 kHz

Stereo Balance: (Left and Right): –12 dB/+3 dB

Volume Control
Deviation in synchronism
< 2 dB in the range
20 Hz – 20 kHz and from 0 dB to –50 dB

Subject to Alteration



TS 1000 HiFi

- 3-Motoren-Tape-Deck
- HiFi nach DIN 45500 schon bei 4,76 cm/s
- Kopfträger wechselbar
- Kopfhörer-Endstufen
- Dolby-NR nachrüstbar
- Motor- und Steuerlogik
- Vorwahlzähler
- Trickausstattung

TS 945 HiFi

- 4-Motoren-Tape-Deck mit IC-Steuerlogik
- HiFi nach DIN 45500
- Positiver Bandlauf
- Kopfhörer-Endstufen
- Vorwahlzähler
- Stereo-Mischpult
- Echo in Mono und Stereo
- Synchroplay, Multiplay

(als TS 925 HiFi auch in Halbspurtechnik erhältlich)

Die ideale Ergänzung für Ihre HiFi-Anlage.

GRUNDIG AG · D-8510 FÜRTH

Mü 55026-941.00